

whistle alert system that allowed neighbors to keep in touch with each other.

Today, the Neighborhood Crime Watch Unit offers support and training for such neighborhood groups, which now total 962 in Boston and account for a third of all streets in the city. The successes have been impressive. Entrenched drug dealers have been exposed and forced out. Muggings have been averted. Suspects have been arrested. Drugs have been seized. Vacant lots have been reclaimed. Neighborhoods have been reborn. Neighborhood watch units have been a vital part of the effort to reduce the crime rate in Boston to the record lows the city is now enjoying.

I commend Christopher Hayes for his innovative leadership and his extraordinary contribution to our city.

#### CONGRATULATIONS TO DR. SHUKRI KHURI OF MASSACHUSETTS WINNER OF THE BERRY PRIZE IN FEDERAL MEDICINE

Mr. KENNEDY. Mr. President. It is an honor to call to the attention of my colleagues that Dr. Shukri F. Khuri of the Brockton/West Roxbury, Massachusetts Veterans Affairs Medical Center, has been awarded the 1998 Frank Brown Berry Prize in Federal Medicine. This high honor is bestowed each year in memory of Dr. Frank Brown Berry, a thoracic surgeon and brigadier general who served in both World War I and World War II, and who served for seven years as the top medical officer in the Department of Defense. The award is presented jointly by U.S. Medicine newspaper and the Science Applications International Cooperation.

Dr. Khuri was chosen for this high honor from a large pool of nominees by a committee of representatives from the National Institutes of Health, the Department of Defense, the Veterans Health Administration, and the staff of U.S. Medicine.

Dr. Khuri received his medical education at the American University of Beirut before coming to the United States in 1972. Many of us know AUB well as one of the premier institutions of higher education in the Middle East, and as one of the strongest bulwarks of American ideals and values in that part of the world. Dr. Khuri's recognition as one of the leading medical practitioner-scientists in the United States reminds us of another important fact about AUB. Many of its graduates—5,000 distinguished alumni—live here in the United States and make major contributions to life and society in America. In fact, Dr. Khuri serves as President of AUB's Alumni Association of North America.

Dr. Khuri is now Chief of Surgical Services and Chief of Cardiothoracic Surgery at Brockton/West Roxbury VA Medical Center, the largest open-heart surgery program in the VA health care system. He also serves as the Vice-Chairman of the Department of Sur-

gery at Brigham and Women's Hospital and is a Professor of Surgery at the Harvard Medical School.

Dr. Khuri was honored with the Berry Prize for his accomplishments in three important areas of medical research and innovation. First, he developed a device that monitors on-line myocardial protection during open heart surgery, a device which enables surgeons to monitor the effect of open heart surgery on the patient and to reduce the chance that the surgery will cause irreversible damage. Dr. Khuri's device is a major innovation, and it seems likely to become a standard piece of equipment in all cardiac surgeries.

Second, in cooperation with the Navy, Dr. Khuri devised strategies to increase the conservation of blood during open-heart surgery. Third, he directed the creation of a model system to assess the quality of care that patients receive by using risk adjustment outcomes. These innovations have significantly affected the practice of medicine in the United States.

I congratulate Dr. Khuri on the Berry Award and for his important contributions to American medicine. I ask unanimous consent to insert at this point in the RECORD an article from the August 1998 issue of U.S. Medicine, which describes Dr. Khuri's accomplishments in greater detail.

There being no objection, the article was ordered to be printed in the RECORD, as follows:

[FROM THE U.S. MEDICINE, AUGUST 1998]  
THE FRANK BROWN BERRY PRIZE FOR 1998;  
CARDIAC SURGERY, QUALITY ASSESSMENT  
Name: Shukri F. Khuri, M.D.

Title: Chief of Surgical Services and Chief of Cardiothoracic Surgery, Brockton-West Roxbury VA Medical Center; Vice Chairman, Department of Surgery, Brigham and Women's Hospital; Professor of Surgery, Harvard Medical School.

Summary Of Accomplishment: Three disparate areas of achievement:

Directing the creation of a model system to assess quality of care using risk adjustment outcomes.

Developing a device that monitors online myocardial protection during open heart surgery.

Through a collaboration with the Navy, devising strategies to better conserve blood during cardiac surgery.

Path To Accomplishment.

Research-Clinical Link: Dr. Khuri chairs the largest open heart surgery program in the health care system, and his medical contributions promise to have a far-reaching impact on medicine.

A native of Palestine, Dr. Khuri received his medical degree with distinction from the American University of Beirut in Lebanon. Following his residency there, he received further training in the 1970s at Johns Hopkins University and at the Mayo Clinic.

Today, his curriculum vitae reads like a book.

When he first arrived in the U.S. in 1972, he relates, his intention was to return to Lebanon eventually, but unfortunately it was 1976 and the strife there was at its height. He could not think of returning.

Harvard University recruited Dr. Khuri to come to West Roxbury VAMC. Again, he planned to stay only a few years, but instead has remained for 22 years.

The West Roxbury VAMC has the oldest and the largest open heart surgery program in the VA system and have been designated by the agency as a Center of Excellence in cardiac surgery, West Roxbury VAMC proudly states.

"I've been chief of cardiac surgery [at West Roxbury] since 1977," he relates, emphasizing that one of the facility's major strengths is offering the ability to combine investigative research with clinical practice.

"I feel we can only improve the way we deliver care by simultaneously conducting practical research that will answer the frustrations that we meet in our daily work. VA is an ideal environment that allowed me to combine both research as well as clinical care."

For example, shortly after arriving he was allowed to pursue his interest in medical informatics. The result was the first automated ICU in the VA system. Subsequently, he chaired the surgery SIUG (Special Interest User Group), and was instrumental in developing software that is in current use in all VA surgical services.

pH In Heart Surgery: Almost all his achievements, Dr. Khuri explains, "have been borne out of some frustration with certain limitations of our current clinical efforts."

During open heart procedures, cardiac surgeons must cross-clamp the aorta and totally interrupt the blood supply to the heart in order to arrest it. However, to avoid irreversible tissue damage to the heart, they also must employ myocardial protection techniques, comprised of administering solutions to the heart. Without such fluids, he explains, surgeon would be able to safely cut off the blood flow to the heart only for 15 to 20 minutes.

This is not enough time; cardiac surgery takes a lot longer, he emphasizes.

"What was frustrating to me was that when we arrested the heart, we had no way of assessing how well we were protecting the heart during this period. There is no way today of knowing while you are operating on the heart how well you are protecting it from irreversible damage."

"This is why we felt it was important in our research to try to come up with a methodology or a technology that would allow us, in an online manner, to monitor the adequacy of the protection of the heart," he explains.

Based on animal experiments, which he had conducted to the John's Hopkins Hospital and West Roxbury. Dr. Khuri proposed in 1983 a novel approach monitoring myocardial tissue and acid-balance as a valuable way to evaluate how successfully the surgeons were protecting the heart during surgery. In a large series of basic animal experiments, which he subsequently conducted both at the West Roxbury VAMC and the NMR Magnel Laboratory at MIT, Dr. Khuri demonstrated that the rise in myocardial tissue hydrogen ion concentration (or fall in myocardial tissue pH, measured with a glass electrode which he had developed in conjunction with Vascular Technology, Inc., based in Chelmsford, Mass., provided an accurate metabolic measure of the magnitude of regional myocardial ischemia (i.e., the damage caused by the lack of adequate nutritive supply).

The electrode which he developed for this purpose is made of special 1 mm in diameter pH-sensitive glass containing silver-silver chloride. Although the full 10 mm length of the electrode is inserted perpendicularly into the heart muscles, its sensing surface is limited to its distal 4 mm tip, allowing assessment of the acid-base balance of the deeper and more vulnerable tissues of the heart.

The most recent prototype of the electrode also allows for the simultaneous measurement of the temperature of the tissues at the

same site of electrode insertion. The electrode is attached to a computerized monitor which corrects for the changes in temperature and provides online readings of both the pH and the hydrogen ion concentration in the heart.

Dr. Khuri's research group conducted animal studies which also demonstrated the utility of the electrode and monitor to measure regional pH changes in tissues other than the hearts, specifically in transposed musculocutaneous flaps and the intestinal wall.

The first myocardial pH measurements in man were reported by Dr. Khuri's group in 1983. Since then, his group has measured pH in more than 600 patients undergoing cardiac surgery. Based on the observations, a new concept of "pH-Guided Myocardial Management" has been formulated by Dr. Khuri and his group.

FDA approval for the Khuri pH Electrode and Monitor was obtained in 1987. At that time, however, "we were reluctant to distribute it nationwide, mainly because there was a lot more that we needed to understand about myocardial tissue pH and what it meant. Most importantly, the thing that really took a great deal of time after we developed the technology was to figure out what maneuvers to employ to maintain normal pH levels in the heart and to reverse a fall in pH.

"That was the key question that we addressed in our clinical and laboratory studies since 1987," Dr. Khuri explains.

The final results of these studies was the development of a set of maneuvers that formed the basis of pH-Guided Myocardial Management.

"The underlying hypotheses behind all of this, which we ultimately have verified, is that acidosis, particularly when severe is bad for the heart." So if a surgeon can prevent myocardial acidosis during surgery chances are it will improve the protection of the heart and ultimately improve the outcome of the patients.

Dr. Khuri is optimistic that the impact of pH-guided myocardial management will be two-fold: surgeons will improve on the adequacy to protect the heart and therefore improve the outcomes of these patients, and also they will have a tool which allows them to assess, in coronary bypass operations exactly how well they have improved the blood supply to the heart.

His data are very compelling and have been shared with leading experts, who "feel that it is a very promising and valuable tool in cardiac surgery," he relates. One leading expert has compared it to the now standard Swan-Ganz catheter developed some 30 years ago. The monitor, which he emphasizes has no known dangers or "downside," might one day become a routine piece of cardiac surgery equipment.

Once it becomes widely available commercially he is confident the Veterans Health Administration will make it a standard operating room device. "The VA [medical] facilities, particularly in cardiac surgery, have a wonderful track record in the use of innovative technology from the pacemaker onwards" he relates. Once the device is available commercially, then "I'm almost certain that it would be applied within the VA."

"But these things do take time. There are many skeptics out there" he notes. "There are many surgeons who believe they already know how to protect the heart and do not need anything new."

Defeating The Bleeding: In 1983, Dr. Khuri formed a collaboration with colleagues at the Naval Blood Research Laboratory (NBRL) in Boston. "one of the most outstanding naval research institutes in the country," to tackle another frustration of

cardiac surgeons—unavoidable bleeding following open heart surgery.

All cardiac surgeons, he explains, are seeking methods to decrease this bleeding which sometimes can be substantial. Through "a very fruitful collaboration" with Dr. C. Robert Valeri and his team at the NBRL, Dr. Khuri has gained a better understanding of this postoperative bleeding.

Through his years of research trying to alleviate this frustration, he has come to understand the exact role of the platelets in bleeding diatheses and has identified a host of factors associated with the platelet which resulted in platelet-dysfunction during cardiopulmonary bypass. These include hypothermia, heparin, and hemodilution.

In addition, "we have demonstrated, for the first time, the value of using frozen platelets as an alternative to using fresh platelets" and have shown, "I think unequivocally that you can use heparin-coated circuits with low-dose heparin to a big advantage during cardiopulmonary bypass."

"We are advocating a compendium of techniques and maneuvers that, in our hands at least, have decreased the magnitude of postoperative bleeding" by almost 80 percent, he relates.

"Our blood loss postoperatively now is really minimal in these patients." His unit has not taken a patient back to the operating room for bleeding in several months, a step which was commonplace previously.

Part of the technique he advocates is the use of heparin-coated circuits with low-dose heparin, which decreases the need for heparin and protamine during cardiopulmonary bypass. Not many institutions are using this technique—including VHA facilities, he points out.

The cardiac surgery unit at Boston University, where the technique also is used, he states, "has had just as dramatic an experience in reducing their blood loss as we have here."

Part of this work has been published, and one paper explaining his work on cryopreserved platelets has been accepted for publication in the *Journal of Thoracic and Cardiovascular Surgery*, which he hopes will add "academic credibility" to his strategy. Dr. Khuri suspects that, following publication, a number of institutions will adopt these procedures to reduce bleeding.

Again, in describing the medical community's reaction, he explains that it often takes time for professionals to adapt a new method or theory. "It's exciting in a way that we are at the cutting edge, but it's also disappointing that it takes time to get this thing to people."

Science is cautiously slow, he concedes.

National Outcome Assessment: Dr. Khuri, as chief of surgery, has found another frustration to consume his time.

"I am someone that believes very, very strongly that VA results have always been excellent in surgery. We have very good surgical centers at the Veterans Health Administration, particularly those that are affiliated with major institutions," he asserts, noting that he is a full professor at Harvard Medical School and all his staff have academic appointments at Harvard.

Unfortunately, the VA has been often criticized for having high mortality rates after surgery. In fact, in the mid '80s, "a very concentrated attack" by the media attempted to "discredit" VA by publishing surgical outcomes, which various periodicals claimed were evidence of higher mortality rates than in the private sector.

"I felt very frustrated by this," he relates. "We were all convinced we were doing a good job and that our results were the same as [his affiliated hospital at] the Brigham."

The difference, he points out, is that VA patients are sicker patients and therefore

are at higher risk of dying as a result of surgery. "No one would dispute this," he stresses.

This debate over higher VA mortality rates reached a climax in 1986, Dr. Khuri relates, prompting Congress to pass a mandate that VA must report its surgical outcomes in comparison to national averages and risk-adjusted for the patients' severity of illnesses. VA also was to report to Congress every two years on how it addressed this mandate.

In 1987, VA asked him to chair a committee to fulfill this task. "It became very evident to us when we met as a group that the congressional mandate was untenable because there were no national standards for surgical outcomes anywhere in the world." There were no models for risk-adjusted outcomes either.

Dr. Khuri's committee advised VA to explain to Congress the lack of national standards and pointed out that the agency was in the unique position not only to develop these national standards, but also to develop risk-adjusted outcomes with which it could compare one VA medical facility to another and to the private sector.

It took almost three years to convince VA to make this claim to Congress and to agree to fund an initiative to address these issues.

The committee he chaired put together a study to examine the unadjusted outcomes in the VA surgical services. In 1991, it launched the National VA Surgical Risk Study in 44 VA medical centers and assigned clinical nurses to collect preoperative, intraoperative, and outcomes data—both deaths and complications on all major operations.

From the inception of the study, an advisory board comprised of leading outside experts advised the study how to proceed and conduct analyses. Dr. Khuri also recruited Dr. Jennifer Daley, an expert in health science research, as his co-chair of the risk study. The results of this prospective analysis ultimately lead to the development of national models that allowed VA to report its outcomes adjusted for the severity of illness of its patients.

O/E Ratio: An assessment system was developed that enabled a particular surgical service to calculate the expected mortality or complications rate for patients undergoing surgery over a certain period of time in that hospital, based on the preoperative severity of their illnesses.

Then using the observed mortality rate for the same period, an observed to expected ratio, or "O/E Ratio" could be generated, he explains.

If the observed ratio is much higher than that expected, based on the severity of the illness of the patients, he explains, the assumption is that there are other factors that have contributed to the high mortality rate of that population, probably related to the quality of care in that institution.

A study was performed to validate the O/E Ratio as a measure of quality of care, and by January 1995, "we had developed for the first time models that would allow for risk adjustment, not only in cardiac surgery, but in almost every major field of non-cardiac surgery."

VA recognized the value of this as a way to continuously monitor the quality of surgical care, Dr. Khuri notes.

"The VA leadership was insightful enough to go along with our recommendation that the models that had been developed should be applied to all the VA's that were doing surgery." The result was the National Surgical Quality Improvement Program (NSQIP), which Dr. Khuri chairs and which basically expanded the methodology employed in the National VA Surgical Risk Study of all 123 VA medical centers performing surgery.

The program uses 88 full-time nurses to collect data on all major surgery in the VA, which is transmitted to the program database in Chicago. The "very rich database" contains more than 500,000 cases, he relates, and generates annually a detailed report for each surgical service at the VA.

The program has published more than 17 publications about the NSQIP data and, within the coming year the program will be accessed through the Internet.

VHA had certain advantages as it implemented the outcome assessment program, he explains. First, the agency's uniform clinical and administrative database and software program—the Decentralized Hospital Computer Program, now known as VISTA—has permitted the NSQIP to access a consistent surgical scheduling module and operating room log in every VAMC to identify all operations performed in operating rooms throughout the country and to centralize the data so that the surgical nurse reviewers enter uniform data.

However, the NSQIP risk models and outcomes may have a few limitations, he cautions, because they may not be generalizable to populations dissimilar to veterans. Further, to reduce the data collection burden for the nurse reviewers, operation- and subspecialty-specific patient risk factors are not collected for non-cardiac surgery.

A final limitation, Dr. Khuri notes, is that the outcomes measured in the NSQIP currently are restricted to the adverse occurrences of postsurgical mortality and morbidity, and length of stay.

"There is a lot of interest now, not just among the VA surgeons, but among the surgical community outside of VA," Dr. Khuri contends, especially with modern medicine's current emphasis on managed care and cost containment.

"VA has completely adopted this," Dr. Khuri proudly notes, and "it is leading the world in the use of risk-adjusted outcomes."

"We think that the NSQIP is providing models that are leading the way towards the qualification of quality of surgery and the ability to compare the quality of care at various institutions using risk adjusted outcomes," Dr. Khuri declares.

Results of the National VA Surgical Risk Study were published as to lead three articles in the October 1997 issue of the *Journal of the American College of Surgeons*, and a full description of the NSQIP will be published in the upcoming October issue of the *Annals of Surgery*.

#### TRIBUTE TO BILL SHIELDS FOR HIS DISTINGUISHED SERVICE TO THE CONGRESS AND THE NATION

Mr. KENNEDY. Mr. President, it is a privilege to pay tribute to Bill Shields of the Department of Defense, who is retiring after two decades of impressive service to the Nation. He is an outstanding attorney whose intellectual skills and dedication have helped to maintain and improve our country's military.

Bill is a native of Buffalo, New York. He received his BA and JD degrees from the University of Buffalo, and a L.L.M. from the National Law Center at George Washington University.

Bill then served in a number of legal positions in the Department of Defense, including assistant in charge of a legal office in Florida, counsel for an air station in Maine, and international law attorney in Japan.

I first met Bill in 1987, when he joined my staff as a Congressional Fellow with the Senate Committee on Labor and Human Resources. As Chairman of that Committee I was extremely impressed with Bill's work on the Polygraph Protection Act and the Minimum Wage Act. He spent endless hours researching these issues, drafting the statutory language, and preparing witnesses and Senators for hearings. His efforts were indispensable in obtaining enactment of those two critical pieces of legislation.

After leaving the Committee, Bill served as Deputy Assistant for Civil Affairs and as Deputy Director of the Appellate Government Division in the Department of the Navy, and excelled in both assignments.

In 1993, he became Legislative Counsel in the Secretary of the Navy's Office of Legislative Affairs. In that position, he worked closely with us on the Senate Armed Services Committee on key issues such as acquisition reform, the A-12 aircraft contract termination, and the Seawolf submarine.

In 1994, Bill was appointed as Counsel and Special Assistant for Legislative Affairs in the Office of the Secretary of Defense. In that position, he has been deeply involved in issues such as research and development, test and evaluation, acquisition policy, major weapons systems, and intelligence. Bill was primary liaison with Congress for the Under Secretary of Defense for Acquisition and Technology, the Director of Defense Research and Engineering, the Director of Test Systems Engineering and Evaluation and the Director of the Defense Advanced Research Projects Agency.

In this capacity, Bill worked with Senators and staff on a daily basis to ensure the effective use of scarce defense resources during a period of major defense restructuring. He was responsible for overseeing the authorization of \$67 billion of the annual DOD budget for such projects as the F/A-18, F-22 and Joint Strike Fighter aircraft, the New Attack Submarine, the Commanche helicopter, numerous medical research projects and the Technology Reinvestment Program. On all of these issues, Bill's leadership, intelligence, and integrity have contributed significantly to the readiness and ability of our troops in the field.

Congress and the nation owe a debt of gratitude to Bill Shields. His skillful leadership will continue to have a lasting impact on our national security for years to come. It has been an honor to be associated with this exceptional public servant. His distinguished service will genuinely be missed, both in the Pentagon and in Congress.

All of us who know Bill are grateful for his leadership and his friendship. We wish him every success in his new position as General Counsel for the American College of Radiology. We know that his wife Maryann, and his three children, Andrew, Molly and Brian, are proud of him as he reaches

this special milestone, and all of us in Congress are proud of him too.

#### THE VERY BAD DEBT BOXSCORE

Mr. HELMS. Mr. President, at the close of business yesterday, Wednesday, October 7, 1998, the federal debt stood at \$5,533,657,715,092.27 (Five trillion, five hundred thirty-three billion, six hundred fifty-seven million, seven hundred fifteen thousand, ninety-two dollars and twenty-seven cents).

One year ago, October 7, 1997, the federal debt stood at \$5,413,433,000,000 (Five trillion, four hundred thirteen billion, four hundred thirty-three million).

Five years ago, October 7, 1993, the federal debt stood at \$4,399,633,000,000 (Four trillion, three hundred ninety-nine billion, six hundred thirty-three million).

Ten years ago, October 7, 1988, the federal debt stood at \$2,617,036,000,000 (Two trillion, six hundred seventeen billion, thirty-six million).

Fifteen years ago, October 7, 1983, the federal debt stood at \$1,384,688,000,000 (One trillion, three hundred eighty-four billion, six hundred eighty-eight million) which reflects a debt increase of more than \$4 trillion—\$4,148,969,715,092.27 (Four trillion, one hundred forty-eight billion, nine hundred sixty-nine million, seven hundred fifteen thousand, ninety-two dollars and twenty-seven cents) during the past 15 years.

#### HONESTY IN SWEEPSTAKES

Mr. CAMPBELL. Mr. President, today I want to take a few moments to let my colleagues in the Senate and House of Representatives know about the progress we have made in promoting Honesty in Sweepstakes during the 105th Congress.

Over the past month, the Honesty in Sweepstakes Act of 1998, S. 2141, made excellent progress as it was refined and polished. These refinements reflect the valuable input I received from witness testimony and my fellow Senators during a Governmental Affairs Subcommittee hearing on S. 2141. The newest Honesty in Sweepstakes language also reflects the results of numerous productive discussions and negotiations with interested parties, including the Postal Service, the industry, the AARP and consumer protection groups.

I want to thank my colleagues, Senator THOMPSON and Senator COCHRAN, who as the respective Chairmen of the Governmental Affairs Committee and the International Security, Proliferation and Federal Services Subcommittee, have been helpful and gracious in their efforts to help me move this sweepstakes reform legislation during the 105th Congress. I also want to thank my good friend, Senator COLLINS, who cosponsored my original Honesty in Sweepstakes bill and provided valuable input that is reflected in the new language I am talking about today.